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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte VERNON T. BRADY, GREG STILWELL,
and EUGENE FISCHER

Appeal 2009-003671
Application 09/975,995¹
Technology Center 2600

Decided: September 16, 2009

Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI, and MARC S.
HOFF, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The real party in interest is Lockheed Martin Corporation.

STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from a Final Rejection of claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-94, and 97-102.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' invention relates to a full duplex communications system capable of wireless transmission rates on the order of 125 Mbps (Spec. 2). A plurality of 90° hybrids are arranged in tandem to output a plurality of amplification channels (Spec. 7). Information transmission is performed using a first polarization, and information reception is performed using a second polarization, to thereby isolate information transmission from information reception in full duplex communication (Spec. 8).

Claim 1 is exemplary of the claims on appeal:

1. Apparatus for full duplex wireless communication of information, comprising:

means for performing at least one of modulating and demodulating information signals, the modulated information signal being boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels;

means for information transmission/reception, said information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication;

regulator means having at least one DC voltage regulator for providing at least two DC output voltages; and

means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold.

² Claims 3-10, 13-18, 20-24, 27, 28, 30-35, 38, 39, 41-75, 84, 85, 95, 96, 103, and 104 have been cancelled.

The Examiner relies upon the following prior art in rejecting the claims on appeal:

Fenter	US 4,459,651	Jul. 10, 1984
Dent	US 5,619,503	Apr. 8, 1997
Kumar	US 5,793,253	Aug. 11, 1998
Bhame	US 5,911,117	Jun. 8, 1999

Claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-88, 90-94, and 97-102 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent in view of Kumar and Fenter.

Claim 89 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent in view of Kumar, Fenter, and Bhame.

Throughout this decision, we make reference to the Appeal Brief (“Br.” filed May 9, 2008), the Reply Brief (“Reply Br.” filed September 9, 2008), and the Examiner’s Answer (“Ans.” mailed July 25, 2008) for their respective details.

ISSUES

Appellants argue that the combination of Dent, Kumar, and Fenter fails to render obvious the claimed invention because Dent fails to teach information transmission using a first polarization and information reception using a second polarization, thereby isolating information transmission from information reception in full duplex communication (App. Br. 6; Reply Br. 2-3); Dent fails to teach that a modulated signal is boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels (App. Br. 7); and Fenter fails to teach at least one DC voltage regulator for providing at least two DC output voltages, including means for inhibiting a first of said two DC voltage outputs when a second of

said two DC voltage outputs is above a predetermined threshold (App. Br. 8-9). In response, the Examiner finds that Dent does teach information transmission using a first polarization and information reception using a second polarization (Ans. 11); that Kumar teaches the 90° hybrid arrangement claimed (Ans. 11-12); and that Fenter teaches both providing a DC voltage regulator having two DC voltage outputs, and inhibiting one when the other rises above a predetermined threshold (Ans. 13).

Appellants' contentions present us with the following issues:

1. Have Appellants shown that the Examiner erred in finding that Dent teaches information transmission using a first polarization and information reception using a second polarization?

2. Have Appellants shown that the Examiner erred in finding that the combination of Dent, Kumar, and Fenter teaches boosting a modulated signal in power using a plurality of 90° hybrids arranged in tandem?

3. Have Appellants shown that the Examiner erred in finding that Fenter teaches at least one DC voltage regulator for providing at least two DC output voltages, including means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold?

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

The Invention

1. According to Appellants, the invention concerns a full duplex communications system capable of wireless transmission rates on the order of 125 Mb/s (Spec. 2). A plurality of 90° hybrids are arranged in tandem to

output a plurality of amplification channels (Spec. 7). Information transmission is performed using a first polarization, and information reception is performed using a second polarization, to thereby isolate information transmission from information reception in full duplex communication (Spec. 8).

Dent

2. Dent teaches that the outputs of two traveling wave tube amplifiers (TWTAs) are connected to a dual-circular-polarized horn antenna 1009 via a polarizer 1008. The function of the polarizer is to launch a Right Hand circularly polarized signal into horn antenna 1009 corresponding to a signal from TWTA 1003 and simultaneously a Left Hand Circularly polarized signal corresponding to the signal from TWTA 1007 (col. 12, ll. 24-31).

3. At the hubstation, the composite signal [transmitted by antenna 1009] is received by a dual circularly polarized antenna and the two polarizations are split into two respective banks of FM receivers (col. 12, ll. 32-34).

4. The “function” of “transportation of signals generated at the hubstation, is used in reverse for radiation by respective satellite antenna elements. . . . The satellite can employ a second, dual-polarized horn antenna” and polarizer 1008 and 1009 as in Fig. 10 with the addition of a transmit/receive diplexing filter for each polarization to separate the transmit and receive signals (col. 12, l. 57 – col. 13, l. 1).

Kumar

5. Kumar teaches that the output terminal of amplifier 63 is coupled to a 1 to 4 power divider 65. This power divider includes three (3) quadrature hybrids 65a, 65b, and 65c (col. 5, ll. 50-53; Fig. 7).

Fenter

6. Fenter teaches, in the context of a voltage regulator having +5VDC and +24VDC outputs, that when the +5VDC output voltage increases above the 5 VDC reference voltage applied to terminal 4, error amplifier circuit 300 operates to generate an output voltage at terminal 9. “This voltage switches on coupler circuit 320 ... At this time, resistor 242 is connected to the cathode of diode 241 holding the voltage that point at slightly above the threshold point at which generator circuit 240 triggers (i.e., 4.5 VDC). Thus, circuit 240 is inhibited from generating further output pulses. This, in turn, prevents further energy from being stored and transferred to the secondary circuits and loads” (col. 8, ll. 52-66).

Bhame

7. Bhame teaches a service protection enclosure to be installed during the construction of a remote wireless telecommunications site, for housing AC power termination connections, AC power distribution panel and circuit breakers, RF transmission cable terminations, and telephone equipment for the termination of the telephone lines leading to and from the site (col. 1, ll. 14-22).

PRINCIPLES OF LAW

On the issue of obviousness, the Supreme Court has stated that “the obviousness analysis cannot be confined by a formalistic conception of the

words teaching, suggestion, and motivation.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007). Further, the Court stated “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. “One of the ways in which a patent’s subject matter can be proved obvious is by noting that there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *Id.* at 419-420.

ANALYSIS

CLAIMS 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-88, 90-94, AND 97-102

We select claim 1 as representative of this group of claims, pursuant to our authority under 37 C.F.R. § 41.37(c)(1)(vii).

Appellants argue that the Examiner erred in rejecting the claims as obvious over the combination of Dent, Kumar, and Fenter because (a) Dent fails to teach information transmission using a first polarization and information reception using a second polarization, thereby isolating information transmission from information reception in full duplex communication (App. Br. 6; Reply Br. 2-3); (b) Dent fails to teach that a modulated signal is boosted in power using a plurality of 90° hybrids arranged in tandem to output a plurality of amplification channels (App. Br. 7); and (c) contrary to the Examiner’s findings, Fenter fails to teach at least one DC voltage regulator for providing at least two DC output voltages, including means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold (App. Br. 8-9).

We are not persuaded by Appellants' arguments.

According to Appellants, Dent teaches transmitting two signals, each having different polarization, but fails to teach transmission using a first polarization and reception using a second polarization (Reply Br. 2; Dent col. 12, ll. 22-31). We agree with Appellants that Dent teaches simultaneous transmission of a left-hand circularly polarized signal and a right-hand circularly polarized signal (FF 2). Dent further teaches, however, that the two transmitted signals are received at the hubstation by a dual circularly polarized antenna (FF 3). Still further, Dent teaches a satellite in which “[t]he same function, namely the transportation of signals generated at the hubstation, is used in reverse for radiation by respective satellite antenna elements” (FF 4), and that “can employ a second, dual-polarized horn antenna for reception, or alternately use the same horn antenna and polarizer 1008 and 1009 as in Fig. 10 with the addition of a transmit/receive diplexing filter for each polarization to separate the transmit and receive signals” (FF 4). Dent thus teaches information transmission using a first and a second polarization, as well as information reception using a first and a second polarization, with concomitant isolation of transmission from reception. Given the open-ended language of the claim (“comprising”), the teachings of Dent thus meet the claimed transmission using a first polarization and reception using a second polarization.

With respect to Appellants' argument that Dent does not teach the claimed 90° hybrids arranged in tandem to output a plurality of channels, the Examiner finds, and we agree, that Kumar rather than Dent teaches the hybrid arrangement claimed (Ans. 3; FF 5). We further agree with the Examiner's reasoning that it would have been obvious to replace the TWT

amplifiers of Dent with the high power solid state microwave transmitter of Kumar to overcome the known disadvantages of TWT amplifiers (Ans. 4).

Last, we are not persuaded by Appellants' argument that Fenter fails to teach a DC voltage regulator for producing at least two DC output voltages, and which inhibits a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold (App. Br. 8-9). Fenter teaches a voltage regulator (illustrated in Fig. 2) that provides DC output voltages of +5V and +24V (col. 8, l. 31). We agree with the Examiner's finding that when Fenter's +5V output rises above a predetermined threshold, error amplifier 300 enables optical coupler 320, which prevents timer 240 from pulsing transistor 170, which effectively prevents further power from being transmitted to the secondary transfer circuits that form the +24V output (FF 6). Fenter thus teaches inhibiting a first DC voltage output when a second DC voltage output is above a predetermined threshold.

Appellants have not established that the Examiner's proposed combination of references fails to teach the claimed invention, nor that the Examiner's stated motivation to combine the references is erroneous. Thus, we will sustain the rejection of claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-88, 90-94, and 97-102 under 35 U.S.C. § 103(a) as being unpatentable over Dent in view of Kumar and Fenter.

CLAIM 89

Appellants argue only that Bhame fails to remedy the deficiencies of the combination of Dent, Kumar, and Fenter asserted with respect to the rejection of claim 1. However, because we affirm the rejection of parent claim 1, from which claim 89 ultimately depends, we will affirm the

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rejection of dependent claim 89 under § 103 for the same reasons expressed with respect to claim 1, *supra*.

CONCLUSIONS OF LAW

1. Appellants have not shown that the Examiner erred in finding that Dent teaches information transmission using a first polarization and information reception using a second polarization.

2. Appellants have not shown that the Examiner erred in finding that the combination of Dent, Kumar, and Fenter teaches boosting a modulated signal in power using a plurality of 90° hybrids arranged in tandem.

3. Appellants have not shown that the Examiner erred in finding that Fenter teaches at least one DC voltage regulator for providing at least two DC output voltages, including means for inhibiting a first of said two DC voltage outputs when a second of said two DC voltage outputs is above a predetermined threshold.

ORDER

The Examiner's rejection of claims 1, 2, 11, 12, 19, 25, 26, 29, 36, 37, 40, 76-83, 86-94, and 97-102 is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ELD

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